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REDISCOVERY OF THE GENUS *PLATYSCELIDRIS* SZABÓ (HYMENOPTERA: SCELIONIDAE) AND DESCRIPTION OF A NEW SPECIES

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Abstract.—*Platyscelidris kittenbergeri* Szabó is redescribed, and a new species, ***P. fossorius***, is described from Madagascar. The genus is remarkably similar in superficial characters to the Australian *Mirobaeoides* Dodd, including the possession of a pair of apical femoral spines in *P. fossorius*. The structure of the antenna and ovipositor place the genus within the Scelionini *sensu* Austin and Field.

Key Words: egg-parasitoid, Afrotropical, Madagascar

Many species of parasitoid wasps of the family Scelionidae display degrees of wing reduction. Some have wings that are merely shortened; others are practically apterous, with the wings so reduced as to be barely visible. This phenomenon is not restricted to any clade within the family, and it may be related, in part, to the need for females to search for host eggs within the litter and soil.

Szabó (1959) described *Platyscelidris* as a new genus of Scelionidae on the basis of a single brachypterous female specimen collected in East Africa in 1905 by the Hungarian big-game hunter Kálmán Kittenberger. Since then, no further specimens have been reported. The original description contains two highly unusual features for a scelionid. The dorsal surface of the mesosoma was said to be made up of only two sclerites, the mesoscutum and the metanotum. Szabó asserted that the scutellum is lacking. Brachyptery is commonly associated with modifications in mesosomatic structure, but the absence of a scutellum is unprecedented. Second, the first metasomatic tergite is reduced: "Petiole very small, present as a semicircular field in the middle of the anterior margin of the second tergite" (our translation). The genus *Baeus* Haliday has T1 hidden in dorsal view, but most species have this sclerite well developed.

Szabó considered the genus to be an intermediate form between the subfamilies Baeinae and Scelioninae, but its precise position within the family was uncertain. Masner (1976) included a brief treatment of *Platyscelidris* in his review of the world Scelionidae and provisionally placed it in the tribe Gryonini (Scelioninae). In his key to genera, *Platyscelidris* falls in the section in which the genera of Baeini (including Idrini) and Gryonini are distinguished, with the main diagnostic character being the reduction in size of the first metasomatic tergite.

We recently sorted a litter sample from Madagascar and discovered specimens of an unusual micropterous species. Our initial impression was that it was a species of *Gryon* Haliday or *Mirobaeoides* Dodd, but closer examination and a review of the literature led us to conclude that we had found a new species of *Platyscelidris*. We here redescribe the genus and its type spe-

cies, describe a new species, and discuss relationships of the genus within the Scelionidae.

Materials and Methods

Specimens for this study are deposited in the collections of the Ohio State University (OSUC), Canadian National Collection of Insects (CNCI), National Museum of Natural History, Smithsonian Institution, Washington, DC (USNM), and the Hungarian Natural History Museum (HNHM). The figures were prepared using a Spot Insight Color® camera (Diagnostic Instruments, Inc.), Auto-Montage version 3.05(3) (Syncroscopy, Inc.), and Adobe® Photoshop® 6.0.1 software. The OSUC numbers refer to unique identifying bar code labels attached to the specimens.

Platyscelidris Szabó

Platyscelidris Szabó 1959: 45, original description. Type species: *Platyscelidris kittenbergeri* Szabó, by monotypy and original designation. Masner 1976: 60, description; Johnson 1992: 461, catalog of world species.

Description.—Female. Head and compound eyes large, prominent; frons convex throughout, without deep scrobe; lateral ocelli contiguous with inner orbits; vertex separated from occiput by sharp angle or broadly rounded; palpal formula apparently 3-2 (palpi very small and largely hidden); antenna 12-merous, clava 6-merous, claval formula A12-A8/1-2-2-2-1; dorsum of mesosoma flattened; skaphion absent, but mesoscutum strongly angled anteriorly; notauli absent; scutellum unarmed; metanotum, where visible, unarmed, appearing as a simple transverse strip; propodeum hidden mesally; tibial spur formula 1-1-1; wings highly reduced or absent; metasoma with 7 tergites, 6 sternites, T7 extruded with ovipositor; laterotergites incised into sternites, submarginal ridge developed; T1 transverse; T2 distinctly longer than T3. ♂ unknown.

Diagnosis.—The 12-merous antenna will distinguish *Platyscelidris* from the superficially similar Australian genus *Mirobaeoides* and all other Baeini (see below). The hidden propodeum and the narrowing of T1 laterally will adequately separate it from species in the diverse genus *Gryon*.

Discussion.—Masner's (1976: 7) key to world genera of Scelioninae must be adapted to include the new species described below.

24(23). Metasoma apparently sessile, T1 much narrower than T2, appearing as a fusiform or small nail-like sclerite situated medially on front margin of T2; scutellum appearing as a narrow transverse sclerite; propodeum entirely hidden medially; micropterous (male unknown) . . . . . *Platyscelidris* Szabó p. 60

– Metasoma variable, T1 normal, almost as wide as T2, transverse; scutellum variable in shape, usually semicircular; propodeum variable, usually entirely visible; wings variable 25

Key to Species of *Platyscelidris*

1. Mesosoma in dorsal view with large mesoscutum followed by single transverse sclerite (scutellum) (Fig. 2); T1 in form of small hemispherical sclerite on anterior margin of T2 (Fig. 2); hind femur without apical spines; hyperoccipital carina absent . . . *P. kittenbergeri* Szabó

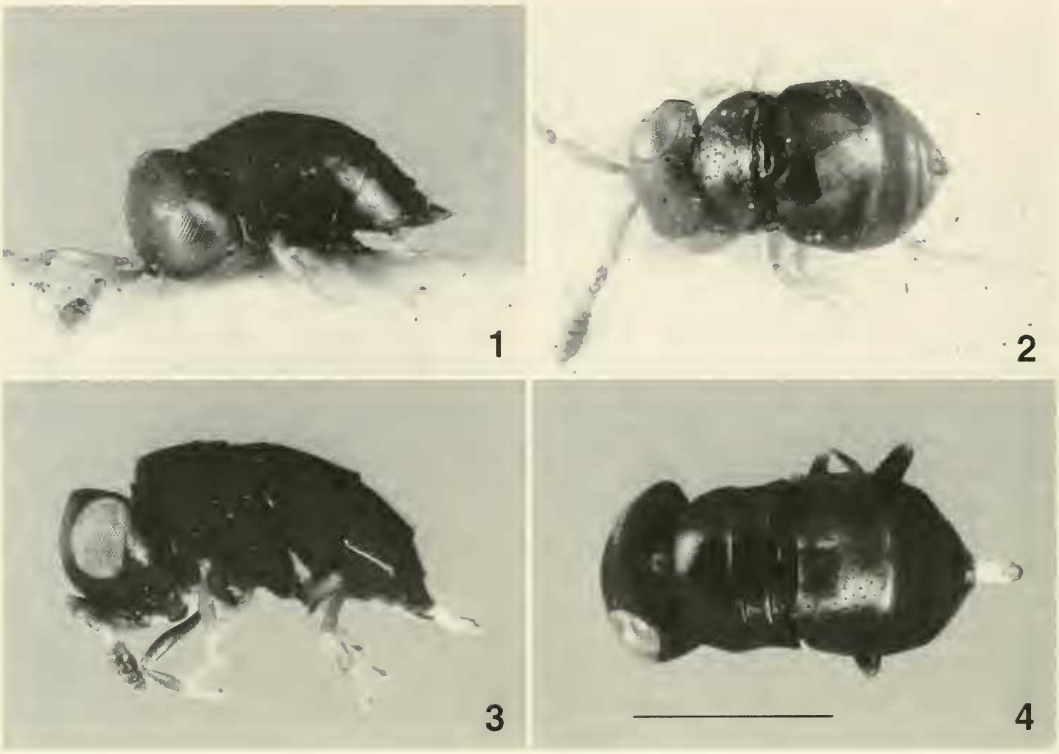
– Mesosoma with mesoscutum followed by two transverse sclerites (scutellum and metanotum) (Fig. 4); T1 forming relatively wide transverse fusiform sclerite (Fig. 4); hind femur with pair of strong apical spines; hyperoccipital carina present . . . . . *P. fossorius*, new species

Platyscelidris kittenbergeri Szabó (Figs. 1–2)

Platyscelidris Kittenbergeri Szabó 1959: 46, original description; Masner 1976: 60, type information.

Female.—Mesosoma, metasoma, A8-A12 brown; head, legs, A1–7 light brown; A1-A7 brown to yellowish brown; length: 0.81 mm.

Head transverse in dorsal view, width 0.41 mm, wider than mesosoma, ratio of head width to mesosoma width 1.15; compound eyes hairless; hyperoccipital carina



Figs. 1–4. 1. *Platyscelidris kittenbergeri*, holotype ♀, lateral view. 2. Same, dorsal view. 3. *Platyscelidris fossorius*, holotype ♀, lateral view. 4. Same, dorsal view. Scale line = 0.50 mm.

absent, vertex broadly rounded onto occiput, aciculate; gena narrowly visible dorsally, with sharp carina parallel to longitudinal axis of body arising from posterior orbit and intersecting occipital carina; compound eyes not bulging, in dorsal view margin in continuous line with frons; occipital carina largely obscured from view; occiput obscured medially by mesoscutum; head in frontal view oval, wider than long, vertex gently arched; ocelli minute; compound eyes relatively small, frons width 0.53 times head width, without distinct frontal depression or central keel; gena appearing convex above anterior mandibular articulation, no surface sculpture visible; lower frons without distinct fanlike striae, with fine aciculate microsculpture, other irregular, asymmetical ridges present, especially ventrally, probably remnants of glue; apex of mandible not visible.

Antenna 12-segmented, clava 6-segmented; claval formula not visible.

Mesosoma slightly narrower than the metasoma, ratio of mesosoma width to metasoma width 0.82; pronotum not visible in dorsal view; mesoscutum semicircular, distinctly overhanging head anteriorly, surface aciculate, with evenly spaced setigerous punctures, associated with fine minute hairs, lateral margins gently raised, punctures absent along posterior margin, notauli absent; wings absent; mesoscutellum strongly transverse, 0.27 times length of mesoscutum, sculptured as mesoscutum; without distinct axillary pits; metanotum, propodeum not visible dorsally; lateral surface of pronotum with deep femoral depression, longitudinally carinate ventrally, with fine aciculate microsculpture above; fore and mid coxae closely approximated, ventral portion of mesepisternum obscured;

mesopleural carina formed by raised ridge, crenulate posteriorly; mesepisternum anterior to mesopleural carina aciculate; mesopleural scrobe very finely sculptured, mesopleural pit present, suture between meso- and metapleuron distinct; antero-ventral corner of metapleuron obscured; metapleuron glabrous, metapleural pit not visible, metapleuron wrinkled, distinctly separated from lateral propodeum by ridge; lateral surface of propodeum smooth, posterior edge of metapleuron and propodeum nearly straight, without lamella; apex of hind femur without apical spines.

Metasoma 1.22 times longer than wide, entirely without longitudinal sculpture, strongly and evenly convex anteriorly; T1 short, length 0.04 mm, longest medially, narrow, not reaching lateral margins of metasoma, aciculate, with very few setigerous punctures; T2 longest segment, length 0.24 mm, transverse, aciculate; T3 length 0.12 mm, punctures absent on posterior border, aciculate to faintly aciculate; T6 without visible setae; T7 hidden; laterotergites smooth, glabrous; S2–S6, where visible, with similar surface sculpture as tergites.

Male.—Unknown.

Host.—Unknown.

Material examined.—Holotype ♀ (examined, HNHM): "Mto-ja-Kifaru, Febr. 905 [on reverse]; Africa or., Katona; *Baeidae* n. gen.; Platyscelidris g.n. Kittenbergeri sp.n. - det. J. B. Szabó; Holotypus! 1958 J. B. Szabó [red label]; Holotypus ♀ Platyscelidris kittenbergeri Szabó 1959 [red margined label]; Hym. Typ. No. 9572 Mus. Budapest." The specimen is in only fair condition, somewhat dirty, and glued on a small card. The second metasomatic tergite is cracked. Much of the surface sculpture of the body is obscured, probably because Szabó seems to have enhanced the magnification of his microscope by immersing the specimen in a drop of water, thus dissolving and spreading some of the adhesive ("Wangen im Wassertropf gesehen . . . ," Szabó 1959: 46). According to Masner (1976), the type locality is in present-day Tanzania. Wheeler (1922) also cited this locality, as "Mto-ya-Kifaru," placed it in German East Africa, and equated it to Arusha-chini, 3°35′S 37°25′E.

Diagnosis.—Distinguished from the new species described below, *P. fossorius*, by the apparent lack of a metanotum, the longitudinal carina on the gena, the rounded vertex without a hyperoccipital carina, and the narrow, semicircular T1.

Platyscelidris fossorius Johnson and Musetti, new species

(Figs. 3–4)

Female.—General coloration dark brown to black; legs, mandible brown; A1–A7 brown to yellowish brown, A8-A12 dark brown; length: 0.90–1.16 mm (mean = 1.08 mm, SD = 0.08 mm).

Head transverse in dorsal view, width 0.48–0.55 mm (mean = 0.52 mm, SD = 0.02 mm), slightly arched around mesosoma, wider than mesosoma, ratio of head width to mesosoma width 1.05–1.15 (mean = 1.10, SD = 0.03); compound eyes hairless; surface sculpture aciculate, with evenly spaced setigerous punctures associated with fine minute hairs; hyperoccipital carina along vertex sharp, angle between vertex and occiput acute; gena not visible dorsally; compound eyes not bulging, margin in continuous line with frons; occipital carina extended ventrally to posterior mandibular articulation, strongly developed laterally, interrupted medially; occiput distinctly concave, aciculate; head in frontal view oval, vertex gently arched; ocelli minute; compound eyes relatively small, frons width 0.46–0.52 times head width (mean = 0.50, SD = 0.02), without distinct frontal depression or central keel; frons and vertex covered with evenly spaced setigerous punctures, with fine minute hairs; gena distinctly reflexed above anterior mandibular articulation, surface aciculate; lower frons finely striate on either side of malar suture, striae radiating from clypeal margin, frons otherwise finely aciculate; mandible triden-

tate, with lower tooth longest, lower and upper teeth longer than median tooth.

Antenna 12-segmented, clava 6-segmented; claval formula A8-A12 1-2-2-2-1.

Mesosoma slightly narrower than the metasoma, ratio of mesosoma width to metasoma width 0.84–0.90 (mean = 0.87, SD = 0.02); pronotum not visible in dorsal view; mesoscutum distinctly transverse, with anterior corners rounded, surface aciculate, with evenly spaced setigerous punctures, associated with fine minute hairs, lateral margins gently raised, punctures absent and faintly aciculate along posterior margin, notauli absent; mesoscutellum strongly transverse, 0.27–0.41 times length of mesoscutum (mean = 0.34, SD = 0.04), sculptured as mesoscutum; two axillary pits anteriorly on either side of mesoscutellum along transscutal articulation; metanotum clearly visible, very narrow, length 0.46–0.68 times length of mesoscutellum (mean = 0.55, SD = 0.07), length 0.62–1.85 times length T1 (mean = 0.99, SD = 0.41), surface aciculate with 1 row of evenly spaced setigerous punctures; propodeum visible dorsally as triangular sclerites on either side of metanotum, surface imbricate-aciculate; lateral surface of pronotum with femoral depression, with longitudinal wrinkles ventrally, otherwise finely aciculate throughout; fore and mid coxae distinctly separated by mesepisternum ventrally; mesopleural carina formed by simple raised ridge with no crenulations; mesepisternum anterior to mesopleural carina aciculate; mesopleural scrobe very finely sculptured, mesopleural pit present, suture between meso- and metapleuron distinct; antero-ventral corner of metapleuron produced ventrally to narrow sharp point; metapleuron glabrous, with distinct round metapleural pit, longitudinal sulcus extending from pit to posterior edge of propodeum; lower ⅔ of lateral surface of propodeum finely sculptured, smooth above, posterior edge of metapleuron and propodeum expanded into thin lamella; apex of hind femur with a pair of spines flanking base of tibia, posterior spine distinctly longer.

Metasoma 1.25–1.44 times longer than wide (mean = 1.31, SD = 0.06), entirely without longitudinal sculpture, strongly and evenly convex anteriorly; T1 short, length 0.03–0.06 mm (mean = 0.05 mm, SD = 0.01 mm), longest medially, aciculate, with very few setigerous punctures; T2 the longest segment, length 0.23–0.32 mm (mean = 0.29, sd = 0.03 mm) transverse, aciculate, punctures absent on anterior third, punctures also absent posteriorly, sculpture faintly aciculate around border; T3 length 0.17–0.24 mm (mean = 0.21 mm, SD = 0.02 mm), punctures absent on posterior border, aciculate to faintly aciculate; T6 covered with very short setae; T7 with long recurved setae on each side; laterotergites smooth, glabrous; S2– S6 with similar surface sculpture as tergites.

Male.—Unknown.

Host.—Unknown.

Material examined.—Holotype ♀: MADAGASCAR: Tuléar Prov., 18 km NNW Betroka, 825 m, 23°09′48″S 48°58′07″E, 24.xi-14.xii.1994, M. A. Ivie and D. A. Pollock, OSUC 60936 (deposited in OSUC).

Paratypes.—Two ♀ with same data as holotype: OSUC 60919, OSUC 60905 (OSUC). MADAGASCAR: Prov. Toliara; Ifaty; 23°09′, 43°37′E; 17–22 Sept. 1993; pitfall trap in sand, desert scrub forest; collrs. W. E. Steiner, R. Andriamassimanana, 1 ♀: OSUC 90316 (CNCI); PT in desert scrub, W. Steiner, 3 ♀: OSUC 90317, OSUC 90318, OSUC 90319 (USNM).

Diagnosis.—Distinguished from *P. kittenbergeri* by the presence of a third dorsal mesosomatic sclerite (the metanotum), the lack of a longitudinal genal carina, the presence of the hyperoccipital carina, and the wide, fusiform T1.

Discussion.—The specimens of *P. fossorius* strongly resemble the genus *Mirobaeoides*, a group of 14 species known only from mainland Australia, Tasmania, and Lord Howe Island (Austin 1986, Johnson

1992). Most female baeines are easily recognized by their 7-segmented antenna with a large, often globose, clava. *Mirobaeoides* is exceptional in this regard, because the female antenna is 11-merous with four clearly separated apical clavomeres. One of the defining features of *Mirobaeoides*, in both sexes, is the possession of a pair of spines at the apex of the hind femur (Austin 1986). The only similar structure described in scelionids are the genual spines of some species of *Gryon*. These spines, however, are more irregular in distribution among species and are found at the base of the hind tibia. The specimens of *P. fossorius* have well-developed apical femoral spines. Despite the difference in the number of antennomeres, we were initially excited to discover an apparent new species of *Mirobaeoides* on the opposite side of the Indian Ocean.

One of the specimens forced us to re-evaluate this conclusion. The apex of the metasoma of this female has a short, cylindrical, membranous tube that bears the seventh metasomatic tergite at its apex (Figs. 3–4). We have not made detailed dissections of the limited material available, but this formation has been described by Field and Austin (1994) and Austin and Field (1997) as a *Scelio*-type ovipositor. This is a set of morphological specializations that produces a long telescoping tube bearing the skeletal elements of the ovipositor at its apex. The length of this tube may be several times the apparent length of the entire metasoma and presumably allows the female much greater range for reaching and parasitizing host eggs. Austin and Field (1997) suggested that the complex of apomorphic features of this ovipositor-type may be used to define a monophyletic group within the subfamily Scelioninae, their Scelionini *sensu lato*, a grouping that dismembers several of the tribes defined by Kozlov (1970) and Masner (1976). All known Baeini have the plesiomorphic appendicular *Ceratobaeus*-type ovipositor. We concluded that the Madagascan specimens could not be assigned to an expanded concept of *Mirobaeoides*, but must somehow fit within the concept of Scelionini outlined by Austin and Field (1997).

The *Scelio*-type ovipositor is a highly complex and integrated set of morphological specializations. We agree with Austin and Field (1997) that joint possession of this set of characters is strong evidence of phylogenetic affinity and can be of help in understanding scelionid relationships. Some groups, e.g., *Opisthacantha* Ashmead, have some species with the *Scelio*-type ovipositor and others with the *Ceratobaeus*-type ovipositor. This may well hint that such a taxon needs to be re-evaluated. We would like to add a note of caution, however. The supposition that the elements of this character set are integrated into an emergent morphological structure implies that the characters themselves may not be independent. Without information on the genetic and developmental mechanisms, it seems plausible to us that any viable character reversal may require reversion of the entire structure to the plesiomorphic *Ceratobaeus*-type condition. The best evidence of the utility of a character set is its compatibility with the totality of other characters and not an *a priori* assumption of its importance.

Szabó (1959) suggested that *Platyscelidris* represents a link between his concepts of Scelioninae and Baeinae. Most authors today consider the Baeinae to be a tribe within Scelioninae, so that hypothesis essentially proposes little other than a vague similarity to baeines. The *Scelio*-type ovipositor allies the genus with the Scelionini *sensu lato*, and not with the Baeini nor Gryonini (as suggested provisionally by Masner 1976). A large part of the difficulty in finding the proper context for this genus arises from the paucity of characters that circumscribe the subfamilies and tribes within Scelionidae. Resolution of the phylogeny of this family would help greatly to resolve such issues as well as provide valuable insights into the mechanisms of host-

finding and shifts from one host taxon to another.

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